

IN THE CLAIMS

Please amend claims 1-26.

Please enter the pending claims as follows:

1 1. (Currently Amended) A broad-angle multilayer (ML) mirror
2 comprising a multiple layer structure over a substrate to provide uniform
3 reflectivity over a wide range of incident angles with small phase shifts, the
4 multiple layer structure comprising ~~36~~ bi-layers ~~wherein~~ with an extra thick layer
5 of Molybdenum next to the substrate ~~has a thickness of 2.4—11.3 nm and Silicon~~
6 ~~has a thickness of 3.5—10.4 nm.~~

1 2. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 the ~~ML mirror~~ multiple layer structure provides an acceptance angle in excess of
3 20° without a significant loss of reflectivity.

1 3. (Currently Amended) The broad-angle ML mirror of claim 2 wherein
2 the loss of reflectivity is approximately 17%.

1 4. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 the ~~ML mirror~~ multiple layer structure increases the ~~relative small~~ phase shifts
3 shift.

1 5. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 the ~~ML mirror~~ multiple layer structure reflects light comprising ~~comprises~~ a
3 13.5nm central wavelength.

1 6. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 the multiple layer structure comprises: Molybdenum having a thickness of 2.4-
3 11.3 nm alternating with Silicon having a thickness of 3.5-10.4 nm in the bi-layers
4 a 13.5nm central wavelength.

1 7. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 each of the bi-layers in the multiple layer structure has ~~have~~ a variable thickness.

1 8. (Currently Amended) The broad-angle ML mirror of claim 1 wherein
2 the multiple layer structure further comprises an extra thick layer of Silicon near
3 the substrate ~~includes additional bi-layers~~.

1 9. (Currently Amended) The broad-angle ML mirror of claim 8 wherein the
2 extra thick layer of Molybdenum is in bi-layer no. 1 ~~additional bi-layers in the~~
3 ~~structure are comprised of Mo/Si bi-layers.~~

1 10. (Currently Amended) The broad-angle ML mirror of claim 8 wherein
2 the extra thick layer of Silicon is in bi-layer no. 3 ~~additional bi-layers in the~~
3 ~~structure have a variable thickness.~~

1 11. (Currently Amended) An optical system having an extreme ultra-
2 violet (EUV) radiation source, the optical system comprising:
3 a mask;
4 a wafer; and
5 a plurality of reflecting surfaces for imaging the mask on the wafer,
6 wherein one or more of the plurality of reflecting surfaces includes a broad-angle
7 multilayer (ML) mirror having a multiple layer structure over a substrate to
8 provide uniform reflectivity over a wide range of incident angles with small
9 phase shifts, the broad-angle ML mirror comprising ~~36~~ bi-layers ~~wherein with an~~
10 extra thick layer of Molybdenum next to the substrate ~~has a thickness of 2.4—~~
11 ~~11.3 nm and Silicon has a thickness of 3.5—10.4 nm.~~

1 12. (Currently Amended) The optical system of claim 11 wherein the
2 plurality of reflecting surfaces comprises six mirrors.

1 13. (Currently Amended) The optical system of claim 11 wherein the
2 broad-angle ML mirror provides an acceptance angle in excess of 20° without a
3 significant loss of reflectivity.

1 14. (Currently Amended) The optical system of claim 13 wherein the ~~ML~~
2 ~~mirror has a~~ loss of reflectivity ~~of~~ is approximately 17%.

1 15. (Currently Amended) The optical system of claim 11 wherein the
2 broad-angle ML mirror increases the small ~~relative~~ phase shifts ~~shift~~.

1 16. (Currently Amended) The optical system of claim 11 wherein the
2 broad-angle ML mirror reflects light comprising ~~comprises~~ a 13.5 nm central
3 wavelength.

1 17. (Currently Amended) The optical system of claim 11 wherein the
2 ~~structure~~ broad-angle ML mirror comprises: Molybdenum having a thickness of
3 2.4-11.3 nm alternating with Silicon having a thickness of 3.5-10.4 nm in the bi-
4 layers ~~a 13.5nm central wavelength~~.

1 18. (Currently Amended) The system of claim 11 wherein each of the bi-
2 layers has ~~have~~ a variable thickness.

1 19. (Currently Amended) The system of claim 11 wherein the ~~structure~~
2 broad-angle mirror includes ~~more than~~ thirty-six bi-layers.

1 20. (Currently Amended) An optical system having an extreme ultra-
2 violet (EUV) radiation source, the system comprising:

3 a mask;

4 a wafer; and

5 a plurality of reflecting surfaces for imaging the mask on the wafer,
6 including:

7 a broad-angle mirror having a multiple layer structure over a substrate to
8 provide uniform reflectivity over a wide range of angles with small phase shifts,
9 the broad-angle mirror comprising ~~36~~ bi-layers ~~wherein~~ with an extra thick layer
10 of Molybdenum next to the substrate ~~has a thickness of 2.4 3.7 nm except for a~~
11 ~~thicker bi-layer 1 nearest substrate and Silicon has a thickness of 3.5 4.1 nm~~
12 ~~except for thicker bi-layers 3, 5, and 15.~~

13 .

1 21. (Currently Amended) The optical system of claim 20 wherein the
2 broad-angle mirror provides an acceptance angle in excess of 20° without a
3 significant loss of reflectivity.

1 22. (Currently Amended) The optical system of claim 21 wherein the
2 ~~mirror has a~~ loss of reflectivity ~~of~~ is approximately 17%.

1 23. (Currently Amended) The optical system of claim 20 wherein the
2 broad-angle mirror reflects light comprising ~~comprises~~ a 13.5nm central
3 wavelength.

1 24. (Currently Amended) The optical system of claim 20 wherein the
2 broad-angle mirror structure further comprises: an extra thick layer of Silicon
3 near the substrate ~~a 13.5nm central wavelength~~.

1 25. (Currently Amended) The optical system of claim 20 wherein each of
2 the bi-layers ~~have~~ has a variable thickness.

1 26. (Currently Amended) The system of claim 20 wherein the broad-
2 angle mirror structure includes ~~more than~~ thirty-six bi-blayers.